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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/728,700	12/05/2003	C. Roger Hickerson	03-0771	9951
24319	7590	05/09/2006	EXAMINER	
LSI LOGIC CORPORATION 1621 BARBER LANE MS: D-106 MILPITAS, CA 95035			DANG, KHANH	
			ART UNIT	PAPER NUMBER
			2111	

DATE MAILED: 05/09/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/728,700

Applicant(s)

HICKERSON ET AL.

Examiner

Khanh Dang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE ____ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 2/16/2006 AMENDMENT.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 and 18-26 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-9 and 18-26 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 18, 20, 21, 22, and 24-26 are rejected under 35 U.S.C. 102(b) as being anticipated by Heil et al. (Heil, 6,173,374).

As broadly drafted, these claims do not define any structure or step that differs from Heil.

With regard to claim 18, Heil discloses a method for managing a remote host bus adapter, comprising: acquiring a Peripheral Component Interconnect (PCI) message request (an I/O request from the host 100 transmitted via a PCI interface 115/116.5/200/230 and received by a local host bus adapter 117); encapsulating the PCI message request in a Fibre Channel (FC) packet (the I/O request is then encapsulated in packet and transmitted via Fiber Channel Backbone 121); and

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transmitting the encapsulated FC packet to a remote host bus adapter (the encapsulated FC packet is transmitted to the remote host bus adapter 126). (in Heil, it is clear that the local host bus adapter 117 is capable of managing the remote host adapter 126 via interface provided by the FC Backbone 121, Fiber Channel Chips 120/122. In particular, local host bus adapter 117 can be initialized as a directory manager to request and receive peer HBAs directory information (see flow chart of Fig. 4C and description thereof) or to demand directory information from peer HBAs (see flow chart of Fig. 4C and description thereof. Further, it is clear that host bus adapter 117/126 includes a bus interface message software driver and local bus interface message hardware and firmware. In particular, each HBA 117, 126 contains managing means which includes the "Distributed block I/O redirector driver software" 240, 331, the I/O shipping ISM 270, 340 and the I/O shipping HDM 280, 350. The I/O redirector software 240, 331 provides the means to allow the HBA 117, 126 to make the decision whether to satisfy a block I/O request locally or remotely. The I/O redirector 240, 331 has the means to search a directory which stores the location of local and remote blocks within the cluster's drives. The directory is stored within HBA cache memory. The managing means coordinates the retrieval of data over a cluster with logically shared disks. Thus, it is clear that software drivers are provided for the local HBA and remote HBA. As noted above, Heil discloses a system for remote host bus adapter management, comprising: a local host bus adapter (HBA 117, Fig. 1, for example); a remote host bus adapter (HBA 126, Fig. 1, for example); and switching and routing means (Fiber Channel Backbone 211, Fig. 1, for example) for communicatively coupling

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the local host bus adapter (HBA 117, Fig. 1, for example) and the remote host bus adapter (HBA 126, Fig. 1, for example). Fibre Channel uses the Gigabit Ethernet physical layer to provide both connection-oriented and connectionless services (see definition of Fiber Channel, cited below).

With regard to claim 20, it is clear that transmission of the encapsulated FC packet occurs over an FC link or FC Backbone 121.

With regard to claim 21, it is clear that the encapsulated FC packet is used by the local host bus adapter 117 to configure the directory and update directory related to the remote host bus adapter 126.

With regard to newly added claims 22 and 24-26, see discussion above, since these claims are directed to the same subject matter that has already been discussed.

With regard to claim 23, the message request (I/O request in Heil, for example) is received by the local host bus adapter 117 from software of the local host 100 via PCI bus interface provided by Host to PCI Bus Bridge 115 connected to PCI Bus 116.5.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Heil in view of the following.

The further difference between the claimed subject matter and that of Heil is the use of Fusion-MPT. However, the use of Fusion-MPT is old and well-known as evidenced by LSI Logic's Fusion-MPT. Fusion-MPT architecture encompasses LSI Logic's Fusion-MPT firmware architecture, LSI Logic's SCSI hardware architecture, LSI Logic's Fibre Channel hardware architecture, and the operating system level drivers that support these architectures. Fusion-MPT architecture has the unique feature of having a single device driver that supports both Fibre Channel and SCSI. LSI Logic's Fusion-MPT architecture is designed to support 64-bit architectures with 64-bit PCI and 64-bit PCI-X interfaces for high host side performance. Fusion-MPT architecture is modular and readily extensible to other host interface architectures as they emerge. Fusion-MPT technology delivers higher performance due to outstanding performance hardware components, sophisticated I/O scheduling, and intelligent firmware design.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to employ Fusion-MPT in the host interface architecture of Heil, as taught by LSI Logic's Fusion-MPT, for the purpose of providing the HBA architecture of Heil with higher performance due to outstanding performance hardware components, sophisticated I/O scheduling, and intelligent firmware design.

Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Heil in view of the following.

The further difference between the claimed subject matter and that of Heil is the use of Fusion-MPT. However, the use of Fusion-MPT is old and well-known as evidenced by LSI Logic's Fusion-MPT. Fusion-MPT architecture encompasses LSI Logic's Fusion-MPT firmware architecture, LSI Logic's SCSI hardware architecture, LSI Logic's Fibre Channel hardware architecture, and the operating system level drivers that support these architectures. Fusion-MPT architecture has the unique feature of having a single device driver that supports both Fibre Channel and SCSI. LSI Logic's Fusion-MPT architecture is designed to support 64-bit architectures with 64-bit PCI and 64-bit PCI-X interfaces for high host side performance. Fusion-MPT architecture is modular and readily extensible to other host interface architectures as they emerge. Fusion-MPT technology delivers higher performance due to outstanding performance hardware components, sophisticated I/O scheduling, and intelligent firmware design. It would have been obvious to one of ordinary skill in the art at the time the invention was made to employ Fusion-MPT in the host interface architecture of Heil, as taught by LSI Logic's Fusion-MPT, for the purpose of providing the HBA architecture of Heil with higher performance due to outstanding performance hardware components, sophisticated I/O scheduling, and intelligent firmware design. Note that it is also well-known that **User Datagram Protocol (UDP)** is one of the core protocols of the Internet protocol suite. Using UDP, programs on networked computers can send short messages known as datagrams to one another. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was use UDP to transfer Fusion-MPT in the host

interface architecture of Heil; since the use of UDP is old and well-known; and sending MPT using UDP in Heil only involves ordinary skill in the art.

Claims 1-4, and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Heil in view of Emulex HBAniware.

With regard to claims 1-3, Heil discloses a system for remote host bus adapter management, comprising: a local host bus adapter (HBA 117, Fig. 1, for example); a remote host bus adapter (HBA 126, Fig. 1, for example); and switching and routing means (Fiber Channel Backbone 211, Fig. 1, for example) for communicatively coupling the local host bus adapter (HBA 117, Fig. 1, for example) and the remote host bus adapter (HBA 126, Fig. 1, for example), wherein the local host bus adapter is capable of managing the remote host bus adapter through a bus interface (in Heil, it is clear that the local host bus adapter 117 is capable of managing the remote host adapter 126 via interface provided by the FC Backbone 121, Fiber Channel Chips 120/122. In particular, local host bus adapter 117 can be initialized as a directory manager to request and receive peer HBAs directory information (see flow chart of Fig. 4C and description thereof) or to demand directory information from peer HBAs (see flow chart of Fig. 4C and description thereof. Further, it is clear that host bus adapter 117/126 includes a bus interface message software driver and local bus interface message hardware and firmware. In particular, each HBA 117, 126 contains managing means which includes the "Distributed block I/O redirector driver software" 240, 331, the I/O shipping ISM 270,

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340 and the I/O shipping HDM 280, 350. The I/O redirector software 240, 331 provides the means to allow the HBA 117, 126 to make the decision whether to satisfy a block I/O request locally or remotely. The I/O redirector 240, 331 has the means to search a directory which stores the location of local and remote blocks within the cluster's drives. The directory is stored within HBA cache memory. The managing means coordinates the retrieval of data over a cluster with logically shared disks. Thus, it is clear that software drivers are provided for the local HBA and remote HBA. As noted above, Heil discloses a system for remote host bus adapter management, comprising: a local host bus adapter (HBA 117, Fig. 1, for example); a remote host bus adapter (HBA 126, Fig. 1, for example); and switching and routing means (Fiber Channel Backbone 211, Fig. 1, for example) for communicatively coupling the local host bus adapter (HBA 117, Fig. 1, for example) and the remote host bus adapter (HBA 126, Fig. 1, for example). Fibre Channel uses the Gigabit Ethernet physical layer to provide both connection-oriented and connectionless services (see definition of Fiber Channel, cited below).

Heil does not disclose modifying a remote host bus adapter management protocol message to include the bus interface message request.

Emulex HBAnyware discloses HBAnyware™ is a centralized HBA management suite that dramatically simplifies SAN management and lowers total cost of ownership. HBAnyware incorporates driver-based technology to enable complete management of Emulex HBAs, including the ability to upgrade firmware anywhere in a Fibre Channel or iSCSI SAN from a single console. HBAnyware leverages Emulex's unique architectural capabilities, including firmware upgradeability and driver compatibility across product

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generations, to further reduce planned downtime and improve IT management productivity. HBAnyware provides an extensible operating system-independent framework for communication with, and management of, Emulex HBAs. The framework consists of host system resident clients, agents and services, as well as an Emulex defined command set utilizing the industry-standard Fibre Channel General Service Common Transport (FC-GS-3 CT) protocol as an "in-band" transport mechanism. In another word, one can use Emulex HBAnyware defined command to modify the industry-standard Fibre Channel General Service Common Transport (FC-GS-3 CT) protocol message to update firmware and driver compatibility for HBAs to further reduce planned downtime and improve IT management productivity.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to employ Emulex HBAnyware in the HBAs of Heil, as taught by Emulex for the purpose of reducing cost, planned downtime, and improving IT management productivity. Note that it is clear from Heil and Emulex HBAnyware that the local HBA 117 must determine whether the remote 126 is capable of receiving the message request before the remote host bus adapter is provided with remote host bus adapter management protocol message modified by the Emulex HBAnyware. With regard to claim 4, it is clear that HBA management provided by HBAnyware including indentifying bus type, since protocol and driver update is directly related to bus type of the HBA. With regard to claim 6, it is clear that in Heil, the bus type is Fibre Channel (FC).

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Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Heil in view of Emulex HBAniware, as applied to claims 1-4, and 6 above, and further in view of the following.

The further difference between the claimed subject matter and that of Heil is the use of SAS bus for the HBA. However, the use of SAS is old and well-known as evidenced by Emulex SLI Architecture, cited below. It would have been obvious to one of ordinary skill in the art at the time the invention was made to employ SAS in Heil, since the use of SAS bus is old and well-known as evidenced by Emulex SLI Architecture; and selecting SAS bus in Heil only involves ordinary skill in the art.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Heil in view of Emulex HBAniware, as applied to claims 1-4, and 6 above, and further in view of the following.

The further difference between the claimed subject matter and that of Heil is the use of Infiniband bus for the HBA. However, the use of Infiniband bus is old and well-known as evidenced by Infiniband Storage, cited below. It would have been obvious to one of ordinary skill in the art at the time the invention was made to employ Infiniband in Heil, since the use of Infiniband bus is old and well-known as evidenced by Infiniband Storage; and selecting Infiniband bus in Heil only involves ordinary skill in the art.

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Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Heil in view of Emulex HBAniware, as applied to claims 1-4, and 6 above, and further in view of the following.

The further difference between the claimed subject matter and that of Heil is the use of iSCSI bus for the HBA. However, the use of iSCSI is old and well-known as evidenced by Emulex SLI Architecture, cited below. It would have been obvious to one of ordinary skill in the art at the time the invention was made to employ iSCSI in Heil, since the use of iSCSI bus is old and well-known as evidenced by Emulex SLI Architecture; and selecting iSCSI bus in Heil only involves ordinary skill in the art.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Heil in view of Emulex HBAniware, as applied to claims 1-4, and 6 above, and further in view of the following.

The further difference between the claimed subject matter and that of Heil is the use of Fusion-MPT. However, the use of Fusion-MPT is old and well-known as evidenced by LSI Logic's Fusion-MPT. Fusion-MPT architecture encompasses LSI Logic's Fusion-MPT firmware architecture, LSI Logic's SCSI hardware architecture, LSI Logic's Fibre Channel hardware architecture, and the operating system level drivers that support these architectures. Fusion-MPT architecture has the unique feature of having a single device driver that supports both Fibre Channel and SCSI. LSI Logic's Fusion-MPT architecture is designed to support 64-bit architectures with 64-bit PCI and 64-bit

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PCI-X interfaces for high host side performance. Fusion-MPT architecture is modular and readily extensible to other host interface architectures as they emerge. Fusion-MPT technology delivers higher performance due to outstanding performance hardware components, sophisticated I/O scheduling, and intelligent firmware design.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to employ Fusion-MPT in the host interface architecture of Heil, as taught by LSI Logic's Fusion-MPT, for the purpose of providing the HBA architecture of Heil with higher performance due to outstanding performance hardware components, sophisticated I/O scheduling, and intelligent firmware design.

Response to Arguments

Applicants' arguments filed 2/16/2006 have been fully considered but they are not persuasive.

At the outset, Applicants are reminded that claims subject to examination will be given their broadest reasonable interpretation consistent with the specification. *In re Morris*, 127 F.3d 1048, 1054-55 (Fed. Cir. 1997). In fact, the "examiner has the duty of police claim language by giving it the broadest reasonable interpretation." *Springs Window Fashions LP v. Novo Industries, L.P.*, 65 USPQ2d 1862, 1830, (Fed. Cir. 2003). Applicants are also reminded that claimed subject matter not the specification, is the measure of the invention. Disclosure contained in the specification cannot be read into the claims for the purpose of avoiding the prior art. *In re Sporck*, 55 CCPA 743, 386 F.2d, 155 USPQ 687 (1986).

With this in mind, the discussion will focus on how the terms and relationships thereof in the claims are met by the references. Response to any limitations that are not in the claims or any arguments that are irrelevant and/or do not relate to any specific claim language will not be warranted.

The Heil 102 Rejection:

Applicants argue that "independent claim 18 recites elements that have not been disclosed, taught or suggested by Heil. For example, claim 18 generally recites: 'wherein the encapsulated FC packet is transmitted to the remote host bus adapter via an external Ethernet link directly connecting a local software driver of a local host bus adapter with a remote software driver of the remote host bus adapter.'" It is contended that Heil does not teach the above-referenced elements of the claimed invention. Therefore, under Lindemann, a prima facie case of anticipation has not been established for claim 18. Thus, independent claim 18 should be allowed. Further, dependent claims 19-21 (which depend on independent claim 18) should also be allowed."

Contrary to Applicants' argument, in Heil, it is clear that the local host bus adapter 117 is capable of managing the remote host adapter 126 via interface provided by the FC Backbone 121, Fiber Channel Chips 120/122. In particular, local host bus adapter 117 can be initialized as a directory manager to request and receive peer HBAs directory information (see flow chart of Fig. 4C and description thereof) or to demand directory information from peer HBAs (see flow chart of Fig. 4C and description thereof).

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Further, it is clear that host bus adapter 117/126 includes a bus interface message software driver and local bus interface message hardware and firmware. In particular, each HBA 117, 126 contains managing means which includes the "Distributed block I/O redirector driver software" 240, 331, the I/O shipping ISM 270, 340 and the I/O shipping HDM 280, 350. The I/O redirector software 240, 331 provides the means to allow the HBA 117, 126 to make the decision whether to satisfy a block I/O request locally or remotely. The I/O redirector 240, 331 has the means to search a directory which stores the location of local and remote blocks within the cluster's drives. The directory is stored within HBA cache memory. The managing means coordinates the retrieval of data over a cluster with logically shared disks. Thus, it is clear that software drivers are provided for the local HBA and remote HBA. As noted above, Heil discloses a system for remote host bus adapter management, comprising: a local host bus adapter (HBA 117, Fig. 1, for example); a remote host bus adapter (HBA 126, Fig. 1, for example); and switching and routing means (Fiber Channel Backbone 211, Fig. 1, for example) for communicatively coupling the local host bus adapter (HBA 117, Fig. 1, for example) and the remote host bus adapter (HBA 126, Fig. 1, for example). Fibre Channel uses the Gigabit Ethernet physical layer to provide both connection-oriented and connectionless services (see definition of Fiber Channel, cited below).

The 103 Rejections:

Applicants rely on the amendment to claims 1 and 18, which add the limitation "wherein the encapsulated FC packet is transmitted to the remote host bus adapter via

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an external Ethernet link directly connecting a local software driver of a local host bus adapter with a remote software driver of the remote host bus adapter" to argue against the 103 rejection.

As already discussed above, such limitation is fully met by Heil.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication should be directed to Khanh Dang at telephone number 571-272-3626.

Khanh Dang

Khanh Dang
Primary Examiner